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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/172,553	10/14/1998	JAMES E. GREEN	2914.IUS	9441

7590 11/20/2003

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EXAMINER

DIAZ, JOSE R

ART UNIT PAPER NUMBER

2815

DATE MAILED: 11/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/172,553

Applicant(s)

GREEN ET AL.

Examiner

José R Díaz

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-35 and 37-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31-35 and 37-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. In view of the appeal brief filed on September 2, 2003, PROSECUTION IS HEREBY REOPENED. *New grounds of rejection* are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 37-41 and 44-45 are still rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claimed steps of providing a HSG polysilicon layer on the storage poly

Art Unit: 2815

structure and lining the recesses with a dielectric material are not supported by Applicant's Specification.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 31-35, 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Regarding claims 31, 33, 35 and 40 the terms "contiguous mesas" and "contiguous webs" renders the claim indefinite because it is not clear the boundary of the claimed mesas or webs. Please clarify the following:

a) With regards to figure 9, what portion of the storage poly 120 constitutes a mesa or web? Also, which portions of the storage poly 120 constitute the top and bottom portions of the mesa or web? In addition, how the depth of the opening or recess 134 is related to the height of the mesa or web? And, please identify at least two contiguous mesas.

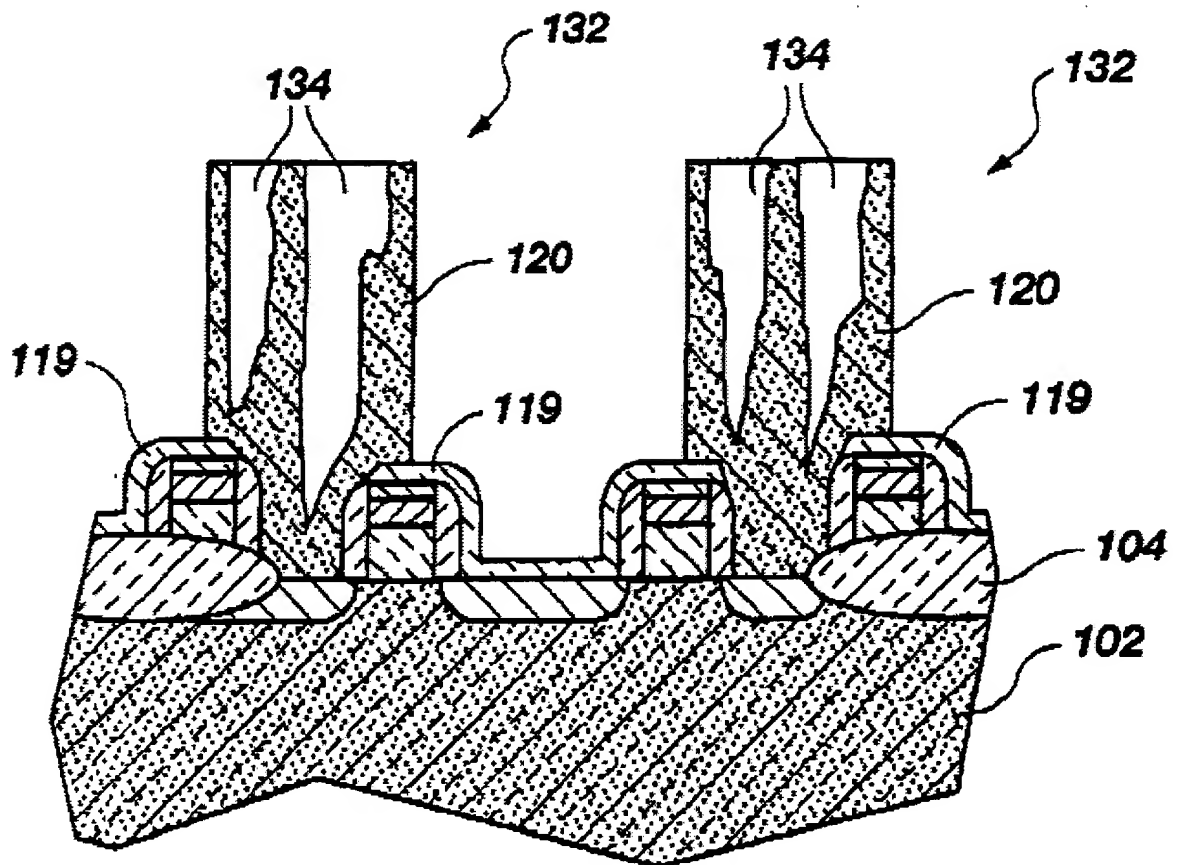


Fig. 9

b) With regards to figure 22 (top view), please identify at least two mesas. Also, identify the start and end points of each mesa. And, please identify at least two contiguous mesas.

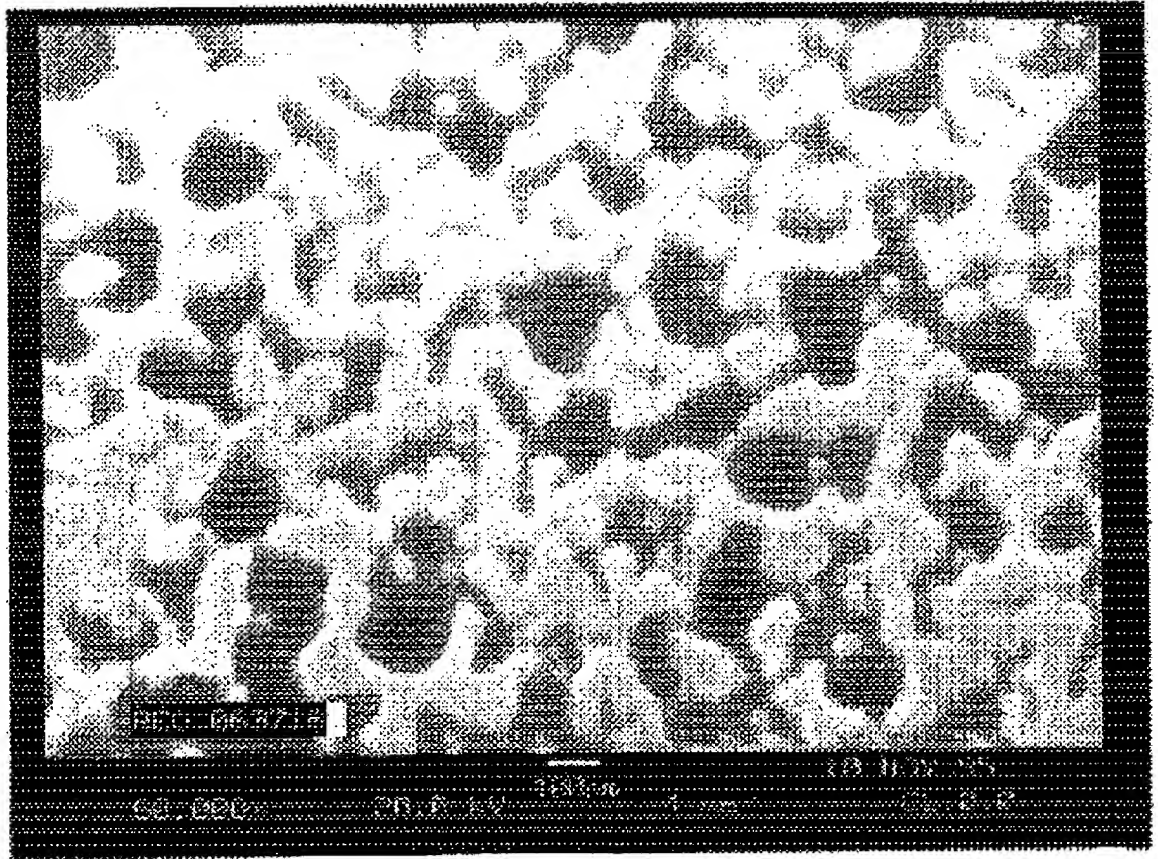


Fig. 22

7. Claims 32 and 34 are rejected due to their dependency on claims 31 and 33, respectively.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2815

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 31-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Woo et al. (US Patent No. 5,405,799).

Regarding claims 31-32, Woo et al. teach a semiconductor capacitor storage poly (30) (see figure 2) comprising: downwardly extending recesses (consider the space between the mesas 23 in fig. 2); and a plurality of *contiguous mesas* (23) extending in the X, Y and Z coordinates (see figure 2) and comprising a plurality of contiguous top surfaces (18) (see fig. 10) forming a maze-like structure (see the passages between the mesas 23 in figures 2 or the passages 17 between the top surfaces 18 in fig. 10).

With regards to the terms "contiguous mesas" or "contiguous webs", please refer to figure 10, below, in which mesas or webs A, B and C are shown connected to one another.

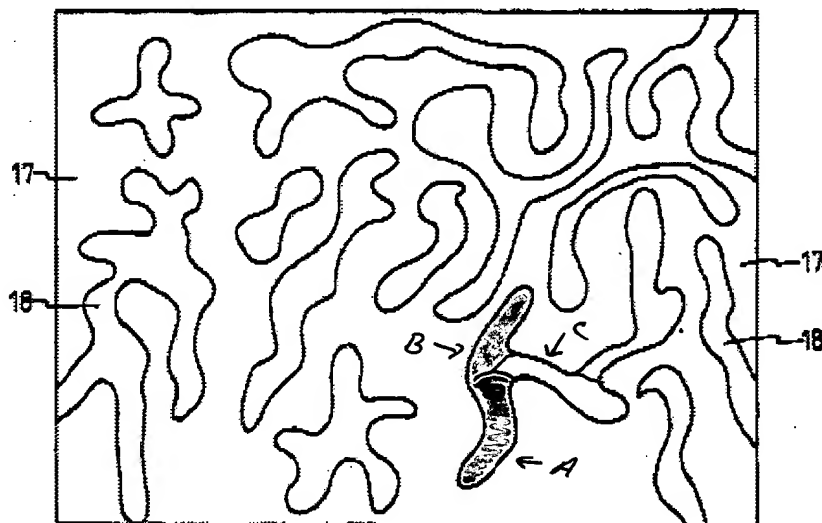


Fig . 10

Regarding claims 33-34, Woo et al. teach a semiconductor capacitor storage poly (30) (see figure 2) comprising: downwardly extending recesses (consider the space between the mesas 23 in fig. 2); a plurality of *contiguous webs* (23) (see fig. 2) comprising a plurality of contiguous top surfaces (18) (see fig. 10) forming a maze-like structure (see the passages between the webs 23 in figures 2 or the passages 17 between the top surfaces 18 in fig. 10) and extending in the X, Y and Z coordinates (see fig. 2); and hemispherical-grain polysilicon (18) on at least some of said plurality of contiguous top surfaces (see figs. 9 and 10).

10. Claim 35 and 37-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Jun et al. (US Patent No. 5,256,587).

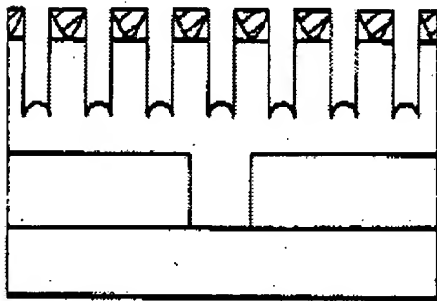
Regarding claims 35 and 43, Jun et al. teaches an intermediate semiconductor capacitor structure (see figure 4c) comprising: a storage poly structure (13) comprising a plurality of contiguous mesas (consider the fingers or columns that include mask 15 and HSG 14 in fig 4c) with recess formed therein (consider the space between the fingers or columns in fig. 4c); a contiguous hemispherical-grain polysilicon (14) over said storage poly structure (13) (see fig. 4c) and a mask (15) over said hemispherical-grain polysilicon layer (14), said recesses (consider the space between the fingers or columns) being exposed through said contiguous hemispherical-grain polysilicon (14) and said mask (15) (see figure 4c).

With regards to the terms "contiguous mesas" or "contiguous webs", please refer to figures 4c and 6c, below. Please note that figure 4c shows shallow recesses that do

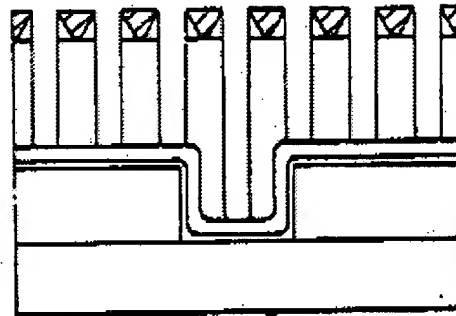
Art Unit: 2815

not disturb the continuity of the storage poly structure 13. Thus, figure 4c shows storage poly fingers connected throughout in an unbroken sequence.

F I G . 4 c



F I G . 6 c



By the contrary, figure 6C shows deep recesses that disturb the continuity of the fingers. Thus, in this case figure 6c does not show contiguous fingers. Therefore, the terms "contiguous mesas" or "contiguous webs" in view of Jun et al. will be define according to figure 4c, in which shallow recesses are provided without disturbing the continuity of the storage poly.

Regarding claims 37 and 44-45, Jun et al. teaches an intermediate semiconductor capacitor structure (see fig. 4d) comprising: a storage poly structure (13) (see fig. 4d); a plurality of low contiguous elevation regions of a hemispherical-grain polysilicon (14) on said storage poly structure (13) (see fig. 4d); recesses (consider the spaces between fingers or columns that are filled with layers 16 and 17) formed in said storage poly structure and located laterally between said low elevation regions of said

Art Unit: 2815

hemispherical-grain polysilicon layer (14) (see fig. 4d); and a dielectric material (16) at least lining the recesses (see figure 4c).

Regarding claim 38, Jun et al. teaches an intermediate semiconductor capacitor structure (see figure 4d) comprising: a storage poly structure (13) (see fig. 4d); low elevation regions of a hemispherical-grain polysilicon (14) on said storage poly structure (13) (see fig. 4d); recesses (consider the spaces between fingers or columns that are filled with layers 16 and 17) formed in said storage poly structure (13) and located laterally between said low elevation regions of said hemispherical-grain polysilicon layer (14) (see figure 4d); and a dielectric material (16) substantially coating an upper surface of said storage poly structure (see top surface of the fingers or columns on which 14 is provided) (see fig. 4d) and lining each of said plurality of recesses (see figure 4d).

Regarding claim 39, Jun et al. teaches a cell poly structure (17) over the dielectric layer (16) (see figure 4d).

Regarding claim 40, Jun et al. teaches a web-like structure (consider the fingers or columns that include HSG 14 in fig 4c) comprising a plurality of contiguous top surfaces (please note that each finger or column includes at least two contiguous HSG triangles 14) (see fig. 4d).

Regarding claim 41, Jun et al. teaches that the recesses (consider the spaces between fingers or columns that are filled with layers 16 and 17) extend into said poly structure (13) (see fig. 4d).

Regarding claim 42, Jun et al. teaches an intermediate semiconductor capacitor structure (see fig. 4b) comprising: a storage poly structure (13) (see figure 4b); a

Art Unit: 2815

substantially confluent HSG polysilicon layer (14) on said storage poly structure (13) (see figure 4b); and a mask (15) over said substantially confluent HSG polysilicon layer (14) (see figure 4b), elevated portions (top portion of the triangle) of said HSG polysilicon layer (14) being exposed through said mask (15) (see fig. 4b).

Response to Arguments

11. Applicant's arguments with respect to claims 31-35 and 37-45 have been considered but are moot in view of the new ground(s) of rejection.

12. With regards to the rejection under 35 U.S.C. 112, first paragraph, please note that the rejection is proper since applicant fails to provide an adequate written description of the claimed invention.

13. With regards to rejection under 35 U.S.C. 102(b) based on the reference Woo et al., please note that such rejection is considered to be proper in view of the new interpretation of the terms "contiguous mesas" and "contiguous webs."

Correspondence

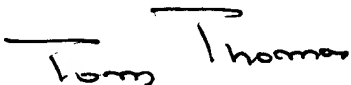
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (703) 308-6078. The examiner can normally be reached on 9:00-5:00 Monday, Tuesday, Thursday and Friday.

Art Unit: 2815

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JRD


TOM THOMAS
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TECHNOLOGY CENTER 2800